AN 16-30APA10-2

HANDBOOK OF OPERATING INSTRUCTIONS

for

PANORAMIC ADAPTERS

AN/APA-10 (XA-3) AND AN/APA-10

NOTE: This handbook replaces AN 08-30APA10-2, dated 15 September 1944.

RESTRICTED

(For Official Use Only)

2 MAY 1945

ERRATA SHEET

Fig 1-1 Item 9	"Cord CG-55---- Two supplied "should be changed to "One each Cord CG-55/AP and one each Cord CG-180/AP Supplied"
Page 1-2	Equipment Supplied Under Cord, (High Impedance CRO vertical Input Probe) CG-55/AP only one cord CG-55/AP is supplied with each equipment. One Cord (high impedance CRO horizontal Input Probe) CG-180/AP is supplied with each equipment.
II 2b(3)	Beyond Serial 50, no output transformer is used and no change in connections need be made to shift from 8000 to 600 ohms impedance.
II 3 Note	Section II Note (Just above Interconnecting Units) Reference to "Two Cords CG-53/AP (high impedance CRO probe cords) etc." should be changed to "One Cord CG-55/AP and one cord CG-180/AP etc."
II 4b(3)(a)	(3) Adjust of Channel "A"---- Add: "When centering is obtained the pointer on the knob for this control is then approximately vertical."
Figure 2-3	Bottom view of Indicator ID-30/APA-10. The high voltage rectifier is a 2X2 not a 5R4GY. The Audio transformer is not used beyond Serial #50 Chassis #8, Audio Output, is used beyond Serial #50 and is located beneath Filter Chassis, #4.
Figure 2-5	Panel View Items 8, 10 and 11 are Ucinite 118152 miniature type jacks, not the 80-239 shown in figure.
II 4	WARNING. Instrument as it leaves factory is properly adjusted. No adjustments should be made unless the operator is certain that the operation is faulty and then only after consulting maintenance manual for this equipment.

II 4 (5) (h) (j) The direction of rotation of the "MAN SWEEP" Control is dependent on the high frequency oscillator of the tuning unit used with the AN/APR-4 receiver. If the high frequency oscillator in the tuning unit is above the signal frequency range of the tuning unit, the calibration of the "MAN SWEEP" dial is correct, i.e., when the receiver is tuned to a higher frequency it will be necessary to turn the "MAN SWEEP" dial to the right in order to bring the image back on the screen.

If the high frequency oscillator in the tuning unit is below the signal frequency range of the tuning unit, the converse of the preceding paragraph will be found to be true. See additions to table 3-1 under Section III.

II 4b(2)b Before final setting HOR GAIN (22) be certain the HOR CENT is so set that the trace is centered on the screen.

II4b(3)1 and II4b(4)f Do not adjust DEVIATION LIMIT controls before consulting maintenance manual.

III 2(a)(2) Table 3-1. Settings of "Channel Selector" switch add the following:

FREQUENCY CALIBRATION OF "MAN SWEEP" CONTROL

RADIO RECEIVING SET	TUNING UNIT	LEFT SIDE	CENTER	RIGHT SIDE
AN/APR-4	TN-16/APR-4	-1 MC	0	+1 MC
AN/APR-4	TN-17/APR-4	-1 MC	0	+1 MC
AN/APR-4	TN-18/APR-4	+1 MC	0	-1 MC
AN/APR-4	TN-19/APR-4	+1 MC	0	-1 MC

III 4c(3) General Oscilloscopic Operation "Insert cords CG-53/AP" should be changed to "Insert cord CG-53/AP into the vertical jack. Insert cord CG-180/AP into the horizontal jack." Miniature connectors are used for these and for CG-113/AP.

IV (a)(5) (b)(6) The spare fuse and pilot lamp are usually located on the terminal strip on the right side of the main chassis.

Fig 5-1 3 "High impedance probe cord CG-53/AP 2 req'd" should be changed to "High impedance probe cords

1 each CG-53/AP req'd
1 each CG-190/AP req'd

Under Cathode Ray Sweep, the frequency of the variable sawtooth generator is 35-40,000 cps.

February 22, 1945

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THE REYNOLDS & REYNOLDS CO., DAYTON, OHIO—5-45—20,700

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AN 16-30APA10-2

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Destruction of Abandoned Materiel in the Combat Zone

In case it should become necessary to prevent the capture of this equipment and when ordered to do so, DESTROY IT SO THAT NO PART OF IT CAN BE SALVAGED, RECOGNIZED, OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS.

Means:—

1. Explosives, when provided.
2. Hammers, axes, sledges, machetes, or whatever heavy object is readily available.
3. Burning by means of incendiaries such as gasoline, oil, paper, or wood.
4. Grenades and shots from available arms.
5. Burying all debris or disposing of it in streams or other bodies of water, where possible and when time permits.

Procedure:—

1. Obliterate all identifying marks. Destroy nameplates and circuit labels.
2. Demolish all panels, castings, switch- and instrument-boards.
3. Destroy all controls, switches, relays, connections, and meters.
4. Rip out all wiring and cut interconnections of electrical equipment. Smash gas, oil, and water-cooling systems in gas-engine generators, etc.
5. Smash every electrical or mechanical part, whether rotating, moving, or fixed.
6. Break up all operating instruments such as keys, phones, microphones, etc.
7. Destroy all classes of carrying cases, straps, containers, etc.
8. Bury or scatter all debris.

DESTROY EVERYTHING!

★

Unsatisfactory Report

For U. S. Army Air Force Personnel:

In the event of malfunctioning, unsatisfactory design, or unsatisfactory installation of any of the component units of this equipment, or if the material contained in this book is considered inadequate or erroneous, an Unsatisfactory Report, AAF Form No. 54, or a report in similar form, shall be submitted in accordance with the provisions of Army Air Force Regulation No. 15-54, listing:

1. Station and organization.
2. Nameplate data (type number or complete nomenclature if nameplate is not attached to the equipment).
3. Date and nature of failure.
4. Radio model and serial number.
5. Remedy used or proposed to prevent recurrence.
6. Handbook errors or inadequacies, if applicable.

For U. S. Navy Personnel:

Report of failure of any part of this equipment during its guaranteed life shall be made on Form N. Aer. 4112, "Report of Unsatisfactory or Defective Material," or a report in similar form, and forwarded in accordance with the latest instructions of the Bureau of Aeronautics. In addition to other distribution required, one copy shall be furnished to the inspector of Naval Materiel (location to be specified) and the Bureau of Ships. Such reports of failure shall include:

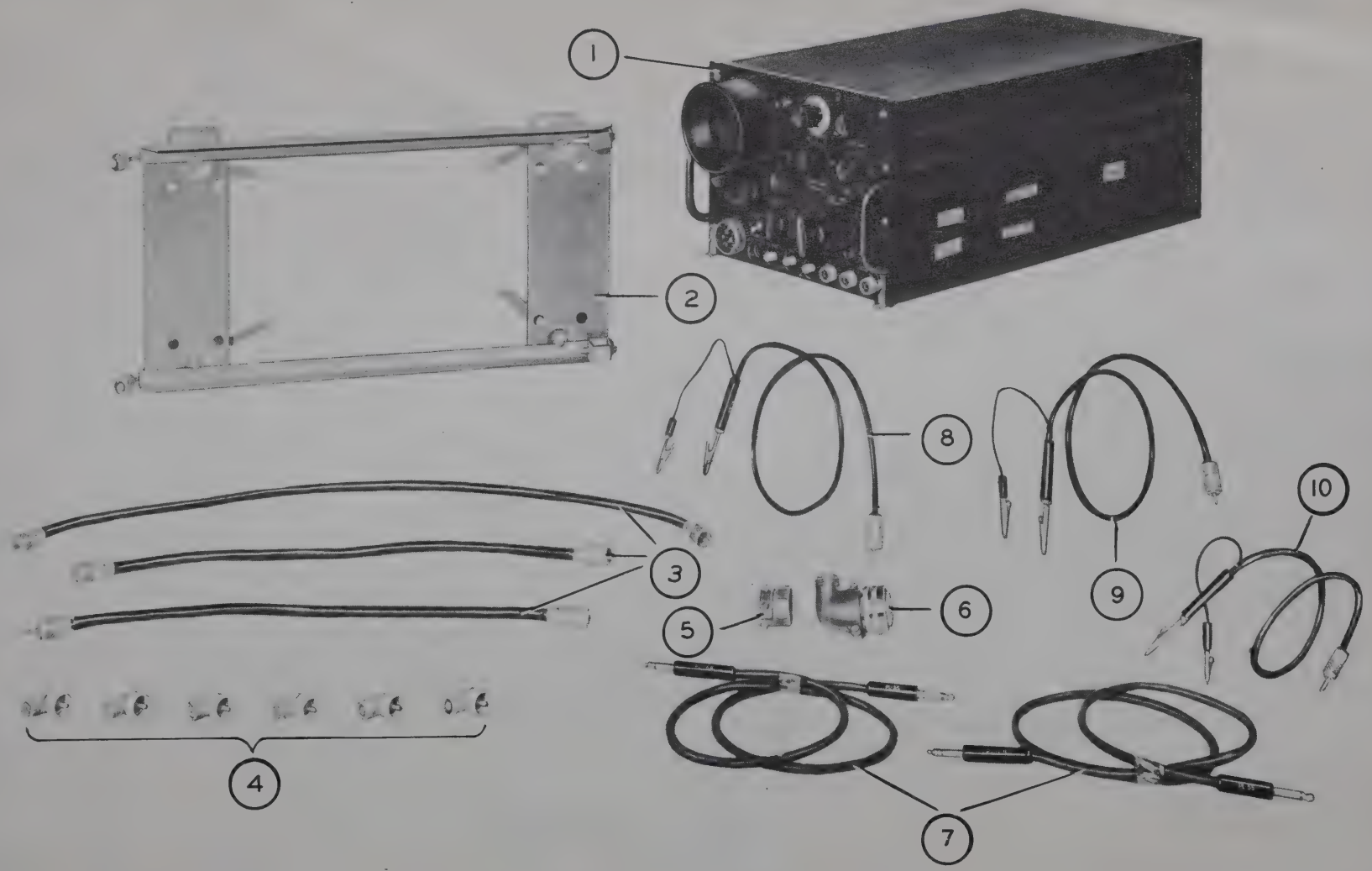
1. Reporting activity.
2. Nameplate data.
3. Date placed in service.
4. Part which failed.
5. Nature and cause of failure.
6. Replacement needed (yes—no).
7. Remedy used or proposed to prevent recurrence.

For British Personnel:

Form 1022 procedure shall be used when reporting failure of radio equipment.

SAFETY NOTICE

THIS EQUIPMENT EMPLOYS HIGH VOLTAGES WHICH ARE DANGEROUS AND MAY BE FATAL IF CONTACTED BY OPERATING PERSONNEL. EXTREME CAUTION SHOULD BE EXERCISED WHEN WORKING WITH THE EQUIPMENT.



(1) Indicator ID-60 (XA)/APA-10 (XA-3)
(2) Mounting Base MT-171/U
(3) Cord CD-800
(4) Adapter M-359
(5) Adapter AN3057-12
(6) Plug AN3108-22-4S
(7) Audio Cables made from Cordage CO-119-B and with Plug PL-68 and Plug PL-55
(8) Cord CG-113/AP Low Impedance CRO Probe)
(9) Cord CG-53/AP (High Impedance CRO Probe)
(10) Cord CG-180/AP High Impedance CRO Probe)

Figure 1-1. Panoramic Adapter AN/APA-10 (XA-3)

SECTION I
GENERAL DESCRIPTION

SPECIAL NOTICE

This handbook gives information on Panoramic Adapters AN/APA-10 (XA-3) and AN/APA-10. References throughout the book to Panoramic Adapter AN/APA-10 (XA-3) will apply equally to Panoramic Adapter AN/APA-10 except where specifically noted.

1. GENERAL.

(See figure 1-1.)

a. PURPOSE. — Panoramic Adapter AN/APA-10 (XA-3), an airborne radio equipment, when connected to suitable radio receiving sets displays on a screen all of the signals within a given frequency band. The signal to which the receiver is tuned is presented at the center of the screen and heard in a headset. Other signals nearby in frequency are visible simultaneously on the screen, and the frequency separation can be read directly from calibration marks. The panoramic adapter can also be used as an independent oscilloscope.

b. POWER SUPPLY.—The panoramic adapter operates on a 105- to 125-volt, 400- to 2600-cycle, single-phase a-c source or from a 75- to 85-volt, 400- to 2600-cycle source. The power consumption is approximately 140 watts. When operating on a 105- to 125-volt supply the current drain is approximately 1.3 amperes.

2. EQUIPMENT SUPPLIED.

The following equipment is supplied with the panoramic adapter.

Quantity per Equipment	*Name of Unit*	*Army Type Designation*	*Navy Type Designation*	*Overall Dimensions (inches)*	*Weight (pounds)*
1	*Indicator	ID-60 (XA)/ APA-10 (XA-3)	ID-60 (XA)/ APA-10 (XA-3)	19 9/16 x 10 1/4 x 7 5/8	40.00
1	Mounting Base	MT-171/U	MT-171/U	22 3/4 x 10 3/8 x 2 1/2	2.18
1	Plug	AN3108-22-4S	AN3108-22-4S	3 1/32 x 1 9/32 x 2 1/6	.216
1	Adapter	AN3057-12	AN3057-12	1 9/16 x 1 3/16	.06
2	Cord	CD-800		20 length	.276
1	Cord	CD-800		30 length	.370
10 feet	Cordage	CO-119-B		(as required)	.41
2	Plug	PL-55		3.61 x 0.500 diameter	.0625
2	Plug	PL-68		3.22 x 0.500 diameter	.06
6	Adapter	M-359		3/4 x 1 1/4 x 1 1/4	.076
1	Cord (High Impedance CRO Probe)	CG-53/AP	CG-53/AP	30 length	.250
1	Cord (Low Impedance CRO Probe)	CG-113/AP	CG-113/AP	30 length	.250
1	Cord (High Impedance CRO Probe)	CG-180/AP	CG-180/AP	30 length	

*References throughout this handbook to Indicator ID-60 (XA)/APA-10 (XA-3) will apply equally to Indicator ID-60/APA-10 unless specifically noted.

3. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

The following equipment is required for operation but is not supplied with Panoramic Adapter AN/APA-10 (XA-3).

Quantity per Equipment	*Name of Unit*	*Army Type Designation*	*Navy Type Designation*	*Required Characteristics*
1	Radio Receiving Set	AN/ARR-7 (or equivalent)	AN/ARR-7 (or equivalent)	Average i-f frequency 455 kilocycles
1	Radio Receiving Set	AN/ARR-5 (or equivalent)	AN/ARR-5 (or equivalent)	Average i-f frequency 5.25 megacycles
1	Receiving Equipment or Radio Set	AN/APR-1 or AN/APR-4 or SCR-587-A (or equivalent)	AN/APR-1, AN/APR-4 (or equivalent)	Average i-f frequency 30 megacycles
1	Headset with Cord			High impedance headset (8000 ohms) equipped with Plug PL-55

SECTION II

INSTALLATION AND ADJUSTMENT

1. UNPACKING EQUIPMENT.

Unpack the equipment carefully, check the components against the list in section I, and see that all removable parts are securely in place. If the package appears to have been damaged, report it to the officer-in-charge.

2. BENCH TEST.

a. Ascertain whether the operating voltage of the airplane is 80 or 115 volts a-c at 400 to 2600 cycles.

(1) Remove Indicator ID-60 (XA)/APA-10 (XA-3) from its case.

(2) Remove the dust cover from chassis No. 5. (See fig. 2-1.)

(3) Set the power transformer tap according to the operating voltage of the airplane. Use tap "1" for the 115-volt source and tap "2" for the 80-volt source. (See fig. 2-2.)

Note

Some models of Indicator ID-60 (XA)/APA-10 (XA-3) are equipped with power transformers having tap connections that vary from those indicated in this handbook.

(4) Replace the dust cover on chassis No. 5.

*b.** Ascertain whether the headset to be used on Indicator ID-60 (XA)/APA-10 (XA-3) is high (8000 ohms) or low (600 ohms) impedance.

(1) Turn Indicator ID-60 (XA)/APA-10 (XA-3) upside down.

(2) Remove the dust cover from chassis No. 3. (See fig. 2-3.)

(3) Connect the output transformer tap according to the headset employed. Use tap "L" for a low impedance headset and tap "H" for a high impedance headset. Indicator ID-60 (XA)/APA-10 (XA-3) as supplied is connected for a high impedance headset.

Note

Beyond serial number 50, an additional stage of amplification (chassis No. 8) is used instead of the audio transformer, and it is neither necessary nor possible to change any connections in order to shift from an 8000-ohm to a 600-ohm impedance headset.

(4) Replace dust cover on chassis No. 3.

(5) Replace the indicator in its case.

3. INSTALLATION.

a. GENERAL.—Lay out drilling holes for Mounting Base MT-171/U so that where Indicator ID-60 (XA)/APA-10 (XA-3) is mounted there will be the following:

(1) Free ventilation for the adapter and the associated radio receiving sets.

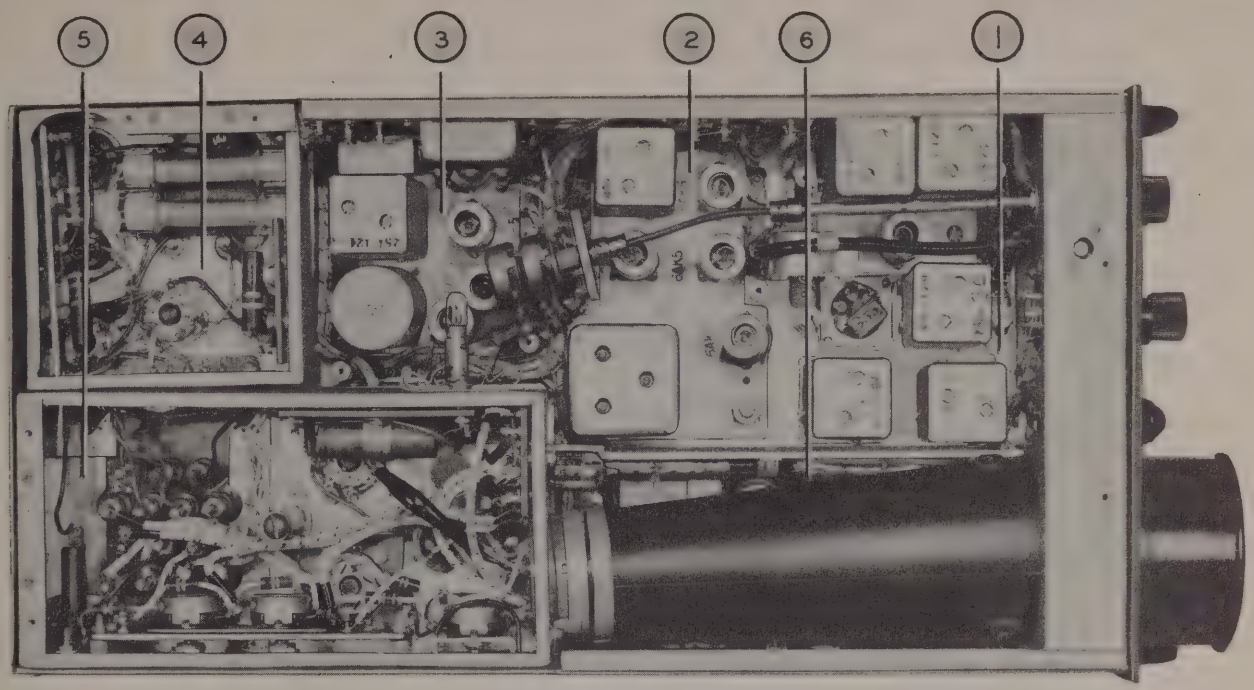
(2) Proper placement for the use of interconnecting cords. (See fig. 5-1.)

(3) Accessibility of adjustments and controls.

b. MOUNTING BASE MT-171/U. — Install as follows:

(1) Mount the base with knurled locking nuts towards the front.

*This paragraph does not apply to indicator ID-60/APA-10. Disregard it if this model indicator is used.



(1) Chassis No. 1
(2) Chassis No. 2
(3) Chassis No. 3
(4) Chassis No. 4
(5) Chassis No. 5
(6) Chassis No. 6

Figure 2-1. Top View of Indicator ID-60 (XA)/APA-10 (XA-3) with Dust Covers Removed

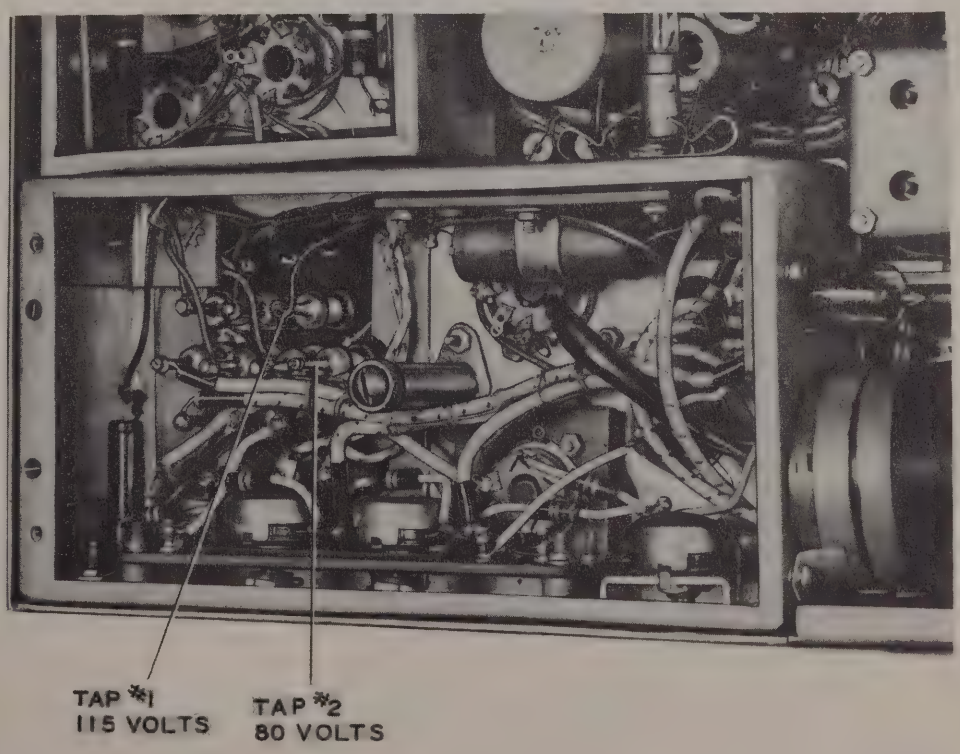


Figure 2-2. Power Transformer Taps — Chassis No. 5

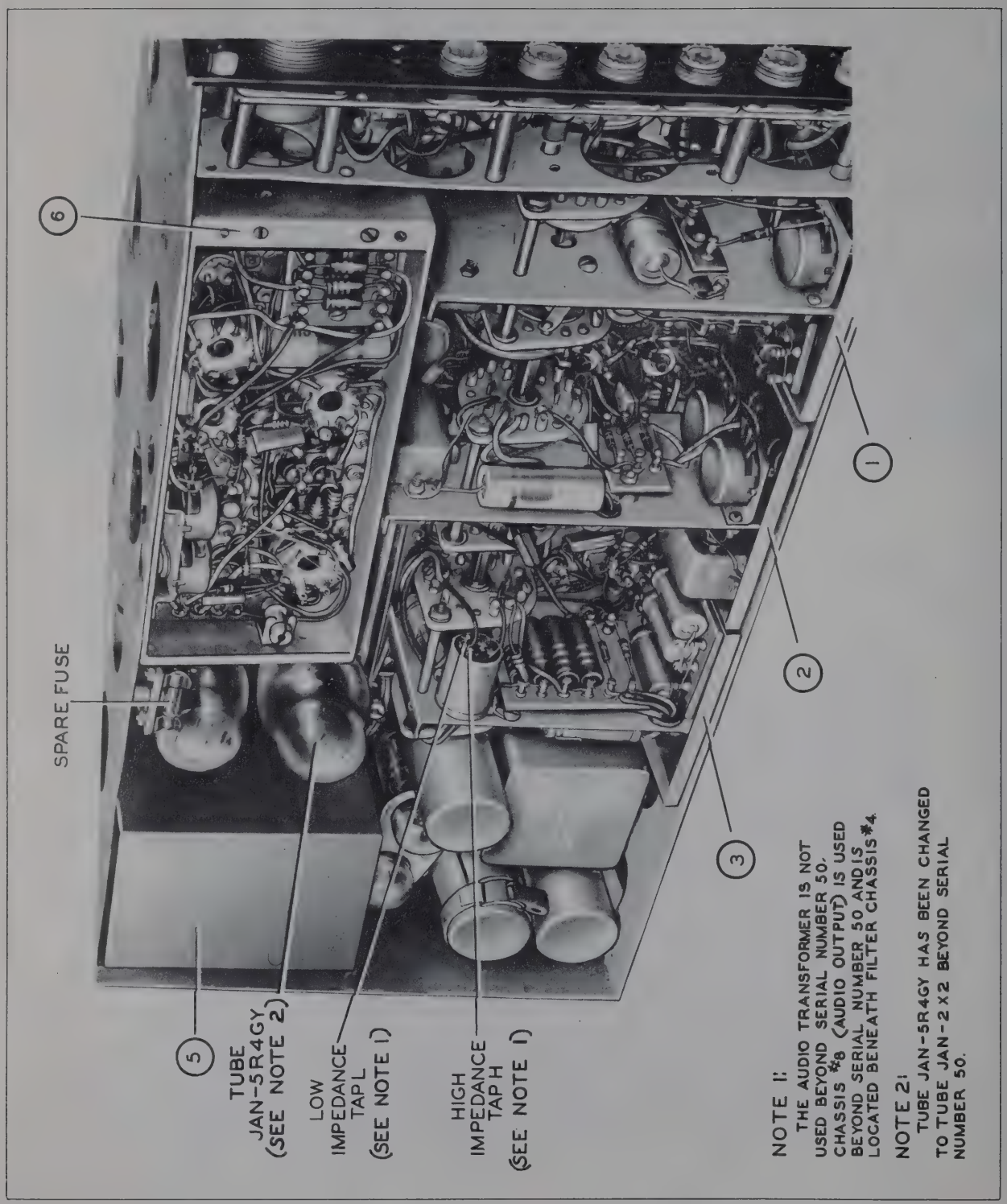

SPARE FUSE
6
5
TUBE JAN-5R4GY (SEE NOTE 2)
LOW IMPEDANCE TAP L (SEE NOTE 1)
HIGH IMPEDANCE TAP H (SEE NOTE 1)
3
2
1
NOTE 1:
THE AUDIO TRANSFORMER IS NOT USED BEYOND SERIAL NUMBER 50. CHASSIS #8 (AUDIO OUTPUT) IS USED BEYOND SERIAL NUMBER 50 AND IS LOCATED BENEATH FILTER CHASSIS #4.
NOTE 2:
TUBE JAN-5R4GY HAS BEEN CHANGED TO TUBE JAN-2X2 BEYOND SERIAL NUMBER 50.

Figure 2-3. Bottom View of Indicator ID-60 (XA)/APA-10 (XA-3) — Dust Covers Removed

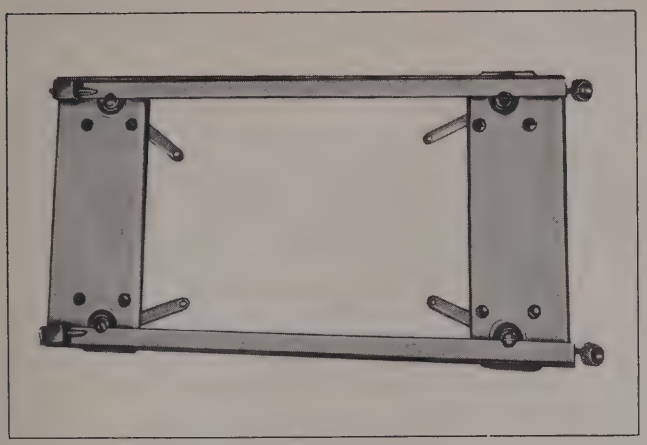


Figure 2-4. Mounting Base MT-171/U

(2) Fasten the unit in place by means of screws inserted in the four mounting feet.

(3) Bond the grounding strips projecting from beneath the mounting base to the frame of the airplane. (See fig. 2-4.)

c. INDICATOR ID-60 (XA)/APA-10 (XA-3). — Install the indicator as follows:

(1) Slide the indicator to the rear of the mounting base so that the two holes in the rear of the indicator engage the two pins projecting from the mounting base.

(2) Secure the indicator in place by means of the two knurled locking nuts located on front of the mounting base.

d. MAKING CABLES.

(1) AUDIO CORDS. *(See fig. 5-1.)*

(a) Cut a length of Cordage CO-119-B long enough to extend from "AUDIO INPUTS A" (terminal 16) on Indicator ID-60 (XA)/APA-10 (XA-3) to the "PHONES" jack on Radio Receiving Set AN/ARR-7. (See figs. 2-5 and 5-1.)

(b) Connect Plug PL-55 to one end of the cord.

(c) Connect Plug PL-68 to the other end of the cord.

(d) Cut a length of Cordage CO-119-B that will extend from the "AUDIO INPUTS B" (terminal 15) on Indicator ID-60(XA)/APA-10(XA-3) to the "PHONES" jack on Radio Receiving Set AN/ARR-5. (See figs. 2-5 and 5-1.)

(e) Repeat steps *(b)* and *(c)* this paragraph.

(2) POWER CABLE.—See fig. 5-2 for specifications and wiring connections.

(a) Cut a length of cable long enough to permit dressing along the fuselage of the airplane from the POWER socket (4) of Indicator ID-60 (XA)/APA-10 (XA-3) to the power source. (See fig. 2-5.)

(b) Connect adapter AN3057-12 and plug AN3108-22-4S to one end.

Note

Three Cords CD-800 are supplied, two are 20 inches in length, one 30 inches in length. Do not alter their length. They consist of a length of Radio Frequency Cable RG-8/U fitted at both ends with a ucinite plug D166366. (See figs. 1-1 and 5-1.) One Cord CG-53/AP (high impedance CRO probe cord) and one Cord CG-180/AP (high impedance CRO probe cord) are supplied. These cords consist of Radio Frequency Cable RG-59/U fitted at one end with a ucinite plug D166366 and at the other with a ground clip and probe clip. A resistor and capacitor are contained within the probe clips. (See figs. 1-1 and 5-1.) One Cord CG-113/AP (low impedance CRO probe cord) is supplied. It is similar to Cord CG-53/AP except that the capacitor and resistor are omitted. (See figs. 1-1 and 5-1.)

e. INTERCONNECTING UNITS.

(1) POWER CABLE.

(a) Connect the power cable to panel socket 4 on Indicator ID-60 (XA)/APA-10 (XA-3) (see fig. 2-5) by means of plug AN3108-22-4S and adapter AN3057-12.

(b) Dress the cable along the fuselage of the airplane to the power source.

(c) Connect the free end to the power source.

(2) CORD CD-800.—Install the three cords as directed below. (See figs. 2-5 and 5-1.)

Note

Use right-angle Adapter M-359 on Cord CD-800 as required.

(a) Connect one end of Cord CD-800 (30 inches long) to "R-F INPUT A" (terminal 12) on Indicator ID-60 (XA)/APA-10 (XA-3). (See fig. 2-5.)

(b) Connect the other end to "PAN" jack for Radio Receiving Set AN/ARR-7. (See fig. 5-1.)

(c) Connect one end of Cord CD-800 (20 inches long) to "R-F INPUT B" (terminal 13) on Indicator ID-60 (XA)/APA-10 (XA-3). (See fig. 2-5.)

(d) Connect the other end to "PANORAMIC" jack for Radio Receiving Set AN/ARR-5. (See fig. 5-1.)

(e) Connect one end of Cord CD-800 (20 inches long) to "R-F INPUT C" (terminal 14) on Indicator ID-60 (XA)/APA-10 (XA-3). (See fig. 2-5.)

(f) Connect the other end to "PAN" jack for Radio Receiving Equipment AN/APR-1 or AN/APR-4 or Radio Set SCR-587-A, depending on which is used. (See fig. 5-1.)

(3) AUDIO CORD.—Install the two audio cords as follows. (See fig. 5-1.)

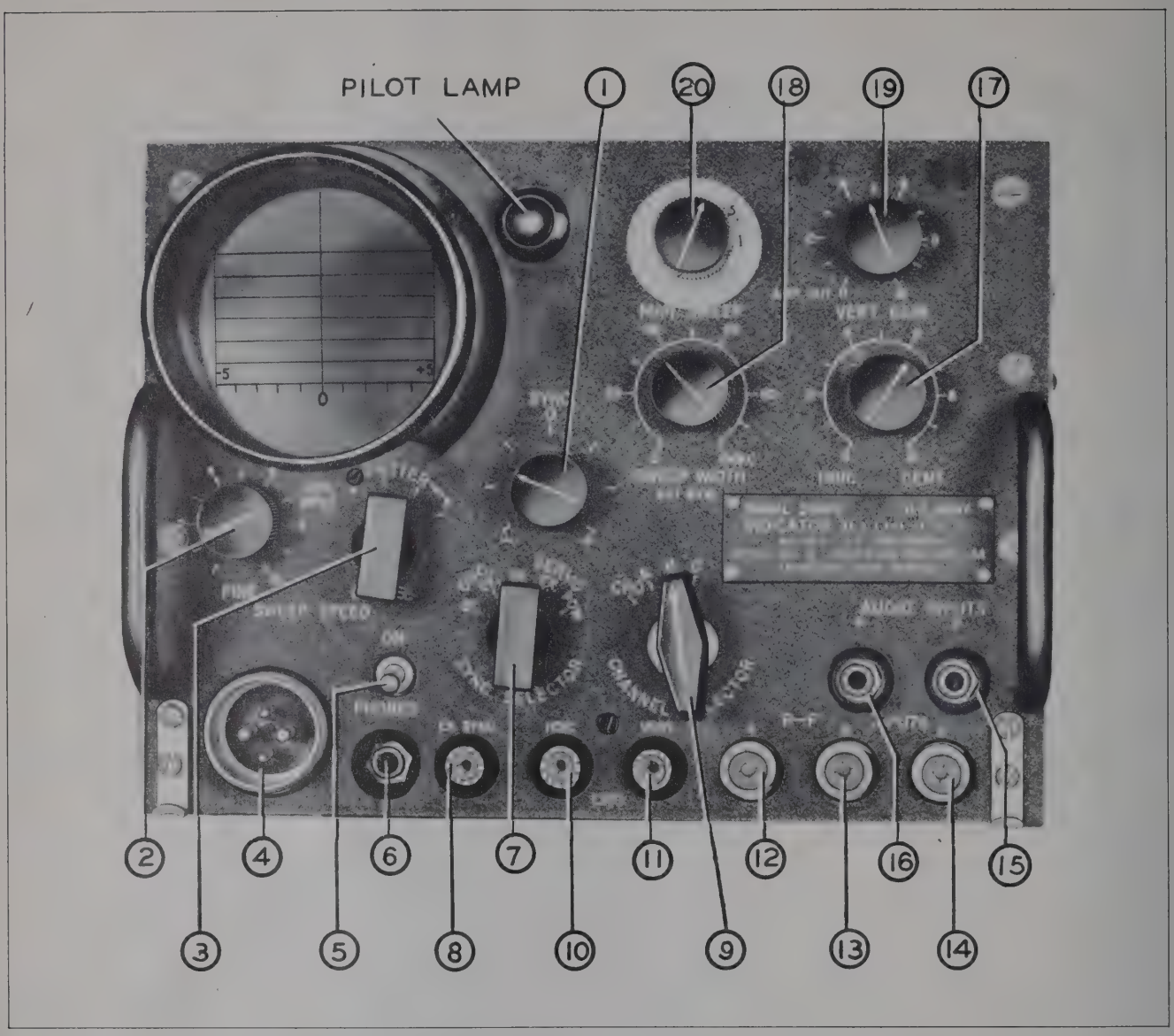


Figure 2-5. Indicator ID-60 (XA)/APA-10 (XA-3) — Panel View

(a) Plug the end of one of the audio cords equipped with Plug PL-68 into the "AUDIO INPUTS A" (terminal 16) on Indicator ID-60 (XA)/APA-10 (XA-3). (See fig. 2-5.)

(b) Plug the other end of the cord equipped with Plug PL-55 into the "PHONES" jack of Radio Receiving Set AN/ARR-7.

(c) Place the remaining audio cord into "AUDIO INPUTS B" (terminal 15) on the indicator and into the "PHONES" jack of Radio Receiving Set AN/ARR-5. (See fig. 2-5.)

(4) HEADSET.—(See fig. 2-5.) Insert a high or low impedance headset that is equipped with a Plug PL-55 into the "PHONES" jack (5) of Indicator ID-60 (XA)/APA-10 (XA-3). (Refer to par. 2*b*., this section.)

4. ADJUSTMENTS.

WARNING

Operation of this equipment involves the use of high voltages that are dangerous to life. Be careful to observe all safety regulations.

a. EQUIPMENT REQUIRED. — One 6-inch screw driver is required for adjusting the equipment.

b. ALIGNMENT PROCEDURE.

IMPORTANT

This equipment is properly adjusted at the factory. Do not make any adjustments unless operation is faulty. In this case, consult the handbook of maintenance instructions for this equipment before making adjustments.

(1) GENERAL.

(a) Turn all power switches on the associated equipment to "ON". (Refer to the handbooks of maintenance instructions for Radio Receiving Set AN/ARR-7 or AN/ARR-5, or for either Radio Receiving Equipment AN/APR-1 or AN/APR-4, or for Radio Set SCR-587-A.)

(b) Turn the "ON-OFF" switch (5) of Indicator ID-60 (XA)/APA-10 (XA-3) to "ON". (See fig. 2-5.)

Note

If the pilot lamp on the indicator does not appear to light, rotate the lamp bezel counterclockwise until it provides the illumination desired.

(2) ADJUSTMENT OF CRO CIRCUITS. *(See fig. 2-5.)*

(a) Turn "CHANNEL SELECTOR" switch (9) located on the panel of the indicator to the "A" position. A trace will appear across the screen and should fall about ¾ inch below the center.

(b) Adjust "HORIZONTAL" GAIN" control (22) with a screw driver until the trace extends between the screen limits marked +5 and —5. (See fig. 2-6.)

Note

Before final setting of the "HORIZONTAL GAIN" control, be sure the "HOR. CENT." control is set so that the trace is centered on the screen.

(c) Adjust the "FOCUS" (25) and "AUX. FOCUS" (23) controls with a screw driver to attain a well-defined line at the ends of the trace. (See fig. 2-6.)

Note

The "BLANKING" (21) and "INTENSITY" (24) controls (see fig. 2-6) are service adjustments and should be reset by maintenance personnel only.

(d) Turn "CHANNEL SELECTOR" switch (9) on the panel of the indicator to "CRO". (See fig. 2-5.) The trace should be approximately centered on the screen.

(e) Adjust "VERTICAL CENTERING" (31) by means of a screw driver to obtain exact centering. (See fig. 2-7.) CRO adjustments are now complete.

(3) ADJUSTMENT OF CHANNEL "A" CIRCUITS (RADIO RECEIVING SET AN/ARR-7). *(See fig. 2-5.)*

(a) Turn "CHANNEL SELECTOR" switch (9) on the indicator to the "A" position. The trace will again fall about ¾ inch below the center of the screen.

(b) Advance the "VERT. GAIN" (19) and "SWEEP WIDTH" (18) controls on the panel of the indicator to maximum.

(c) Advance the "A" channel "SENSITIVITY" control (28) on the indicator (see fig. 2-7) with a screw driver until a series of small bobbing peaks *(grass)* appear; these represent noise detected by the unit. Adjust "SENSITIVITY" control (28) so that these noise peaks are about ¼ inch in height.

(d) Tune Radio Receiving Set AN/ARR-7 to any available signal until it is heard in the headset connected to the indicator. The signal heard should be seen approximately centered (left to right) on the screen of the indicator.

(e) Rotate "HOR. CENT." control (17) on the indicator until centering is obtained. When centering is obtained, the pointer on the control knob will be approximately vertical.

(f) Adjust "VERT. GAIN" control (19) on the indicator to obtain a satisfactory signal size.

(g) Tune the radio receiving set 50 kilocycles to the low-frequency side of the signal. This should cause the signal to shift to the extreme right-hand mark on the screen.

(h) Tune the radio receiving set 50 kilocycles to the high-frequency side of the signal. This should cause the signal to shift to the extreme left-hand mark on the screen.

(i) In steps *(g)* and *(h)* above, should the signal fail to shift sufficiently or should it shift so much as to be no longer visible on the screen of the indicator, adjust "DEVIATION LIMIT" control (29) (fig. 2-7) for channel "A" by means of a screw driver until the conditions in *(g)* and *(h)* above are obtained.

IMPORTANT

Do not adjust the "DEVIATION LIMIT" control before consulting the handbook of maintenance instructions for subject equipment.

(4) ADJUSTMENT OF CHANNEL "B" CIRCUITS (RADIO RECEIVING SET AN/ARR-5). *(See figure 2-5.)*

(a) Turn "CHANNEL SELECTOR" switch (9) on the indicator to the "B" position. The trace will fall about ¾ inch below the center of the screen.

(b) Advance "VERT. GAIN" (19) and "SWEEP WIDTH" (18) controls on the panel of the indicator to maximum.

Note

Channel "B" is set for maximum sensitivity. No variable sensitivity control is provided.

(c) Tune the radio receiving set to any available signal until it is heard in the headset connected to the indicator.

(d) Center the signal heard on the screen of the indicator by means of "HOR. CENT." control (17).

(e) Adjust panel control "VERT. GAIN" (19) of the indicator to obtain a satisfactory signal size.

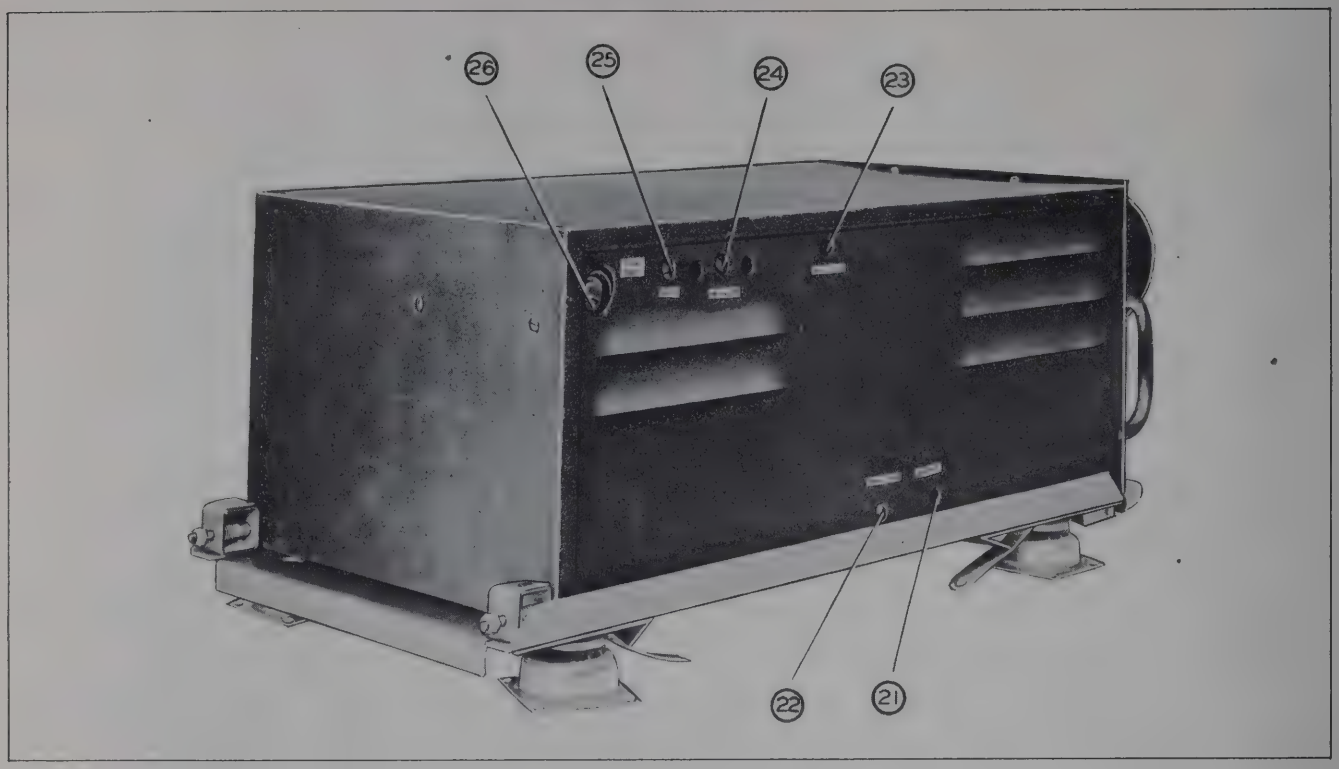


Figure 2-6. Indicator ID-60 (XA)/APA-10 (XA-3) — Left Side View Showing Fuse and Control Adjustments

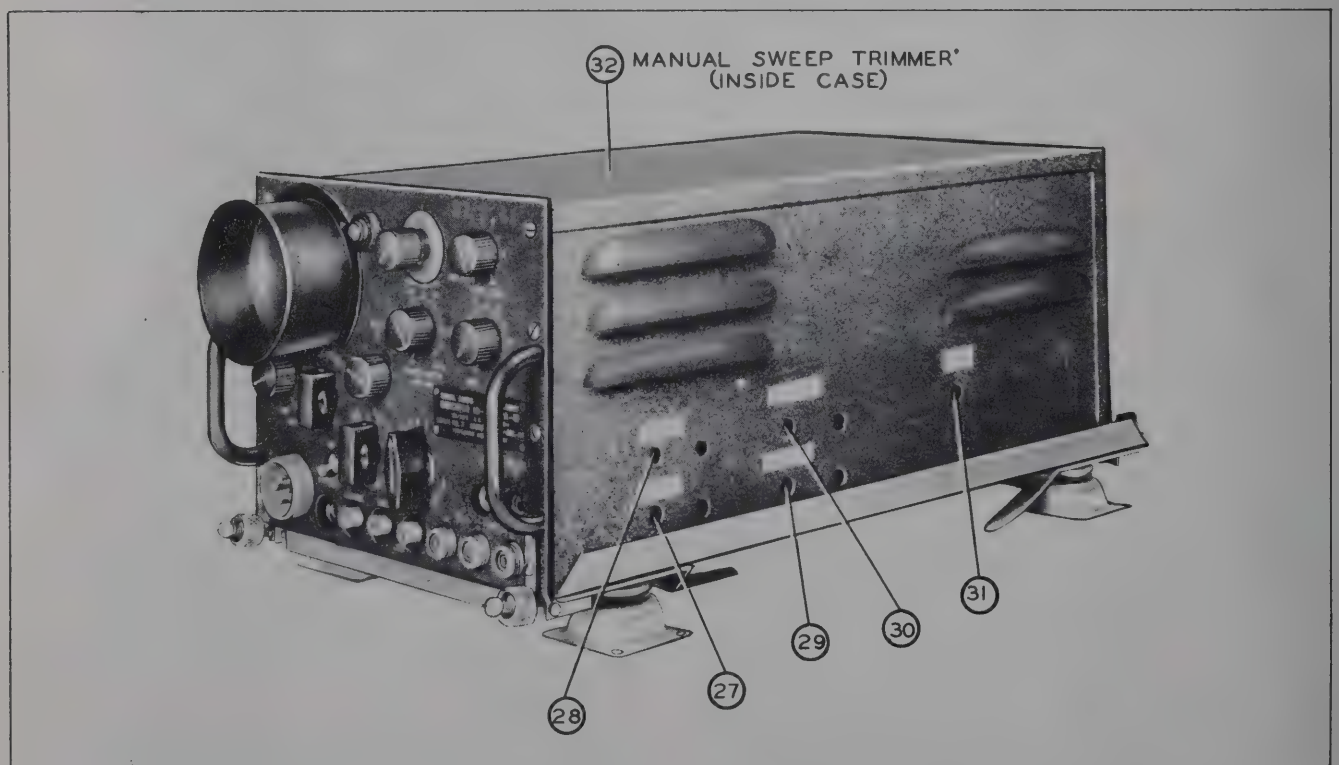


Figure 2-7. Indicator ID-60 (XA)/APA-10 (XA-3) — Right Side View Showing Control Adjustments

(f) Tune radio receiving set 500 kilocycles to the low-frequency side of the signal being received and then 500 kilocycles to the high-frequency side of the signal being received, noting whether the signal peak shifts alternately to the marks on the extreme right and left on the screen of the indicator. If the deviation is found to be insufficient or excessive, adjust "DEVIATION LIMIT" control (30) until the above condition does occur. (See fig. 2-7.)

IMPORTANT

Do not adjust the "DEVIATION LIMIT" control until after referring to the handbook of maintenance instructions for this equipment.

(5) ADJUSTMENT OF CHANNEL "C" CIRCUITS (Radio Receiving Equipment AN/APR-1 or AN/APR-4, or Radio Set SCR-587-A). (See fig. 2-5.)

(a) Turn "CHANNEL SELECTOR" switch (9) on the indicator to the "C" position. The trace will be found along the horizontal center line as in the case of the CRO adjustment. (Refer to par. *4b*(2)*(d)*, this section.)

(b) Advance "VERT. GAIN" control (19) on the indicator to maximum.

Note

"SWEEP WIDTH" control (18) is inoperative for channel "C".

(c) Set "MAN. SWEEP" control (20) on the indicator to its zero or center position.

(d) Advance the "C" channel "SENSITIVITY" control (27) using a screw driver as directed in paragraph *4b*(3)*(c)*, this section. (See fig. 2-7.)

(e) Tune the associated radio receiver to any available signal until it is heard in the headset connected to the indicator. The signal heard will be seen centered on the screen.

(f) Adjust "VERT. GAIN" control (19) of the indicator to obtain satisfactory signal size.

(g) Tune the associated radio receiver 1 megacycle to the high-frequency side of the received signal.

(h) Rotate "MAN. SWEEP" control (20) to its minus 1 megacycle setting. The signal originally received should reappear on the screen of the indicator.

Note

If the high-frequency oscillator, in the tuning unit of Receiving Equipment AN/APR-4, is *above* the signal frequency range when turning the receiver to a higher frequency, turn the "MAN. SWEEP" dial to the plus side to bring the image back on the screen. If the high frequency oscillator is *below* the signal frequency range of the tuning unit when turning the receiver to a higher frequency, turn the "MAN. SWEEP" dial to the minus side to bring the image back on the screen.

(i) Tune the associated radio receiver 1 megacycle to the low-frequency side of the received signal.

(j) Rotate "MAN. SWEEP" control (20) to its plus 1 megacycle setting; the signal originally received should reappear on the screen of the indicator.

(k) If in steps *(h)* and *(j)* the received signal cannot be brought on to the screen of the indicator at the plus 1 or minus 1 setting of "MAN. SWEEP" control (20) tune the associated radio receiver to either ± 1 megacycle of the original received signal.

(l) Set "MAN. SWEEP" control (20) to either ± 1 megacycle, the opposite of whatever frequency setting is used in *(k)* above.

(m) With a screw driver adjust the "MANUAL SWEEP TRIMMER" (32) to bring the signal on to the screen at the proper calibrated point. (See fig. 2-7.)

(6) DISCONNECTING POWER. — Turn power switches to "OFF" on all the radio receiving sets employed. Turn the "ON-OFF" switch on the indicator to "OFF". The adjustments for Panoramic Adapter AN/APA-10 (XA-3) are complete.

SECTION III

OPERATION

1. FUNCTION.

Panoramic Adapter AN/APA-10 (XA-3) presents visually and audibly the signals received by any of the associated radio receiving sets. The type of presentation depends upon which receiver is selected by means of the "CHANNEL SELECTOR" switch on the indicator.

a. RADIO RECEIVING SET AN/ARR-7 OR EQUIVALENT.—When the panoramic adapter is used with Radio Receiving Set AN/ARR-7 or equivalent and the "CHANNEL SELECTOR" switch is set to "A", the visual presentation is that of signals received within a band of frequencies from plus 50 to minus 50 kilocycles of the signal to which the receiver is tuned. It is identified as channel A and is said to be panoramic. The signal to which the receiver is tuned is also heard in the headset of Indicator ID-60 (XA)/APA-10 (XA-3).

b. RADIO RECEIVING SET AN/ARR-5 OR EQUIVALENT.—When the panoramic adapter is used

with Radio Receiving Set AN/ARR-5 or equivalent and the "CHANNEL SELECTOR" switch is set to "B", the visual presentation is that of signals received within a band of frequencies from plus 500 to minus 500 kilocycles of the signal to which the receiver is tuned. It is identified as channel B and is said to be panoramic. The signal to which the receiver is tuned is also heard in the headset of Indicator ID-60 (XA)/APA-10 (XA-3).

c. RADIO RECEIVING EQUIPMENT AN/APR-1 OR AN/APR-4, OR RADIO SET SCR-587-A.—When the panoramic adapter is used with any one of these radio receiving sets and the "CHANNEL SELECTOR" switch is set to "C", the visual presentation is a non-panoramic one of signals within plus 25 kilocycles to minus 25 kilocycles of the signal to which the receiver is tuned. It is identified as channel "C" and the presentation is said to be oscillographic. The signal to which the receiver is tuned is also heard in the headset of Indicator ID-60 (XA)/APA-10 (XA-3).

2. INTERPRETATION OF SIGNALS.

a. PANORAMIC PRESENTATION.

(1) Panoramic presentation provides a picture of signals occurring within a band of frequencies. Referring to figure 3-1, signals will appear as peaks above the base line on the screen of Indicator ID-60 (XA)/APA-10 (XA-3). The shape of the signal peaks will disclose the nature of the signals as well as their position in the radio spectrum. The relative heights of the signals will be an indication of their relative strengths. The position of the peaks on the screen will be fixed with reference to a center-frequency or peak (that to which the radio receiving set is tuned). A band of frequencies is thus scanned to show signals other than the one tuned to by the receiver and heard in the headset, in other words, a "panorama" or "parade" of signals may be seen.

(2) The calibrations of the indicator screen depend upon the associated radio receiving set and the setting of the "CHANNEL SELECTOR" switch described in the following table:

TABLE 3-1. SETTINGS OF "CHANNEL SELECTOR" SWITCH

Radio Receiving Set	*"CHANNEL SELECTOR" Position*	*Frequency Calibration of Screen*		
		Left Side	*Center*	*Right Side*
Radio Receiving Set AN/ARR-7	A	−50 kc	0	+50 kc
Radio Receiving Set AN/ARR-5 (Low-frequency band)	B	−500 kc	0	+500 kc
Radio Receiving Set AN/ARR-5 (Two high-frequency bands)	B	+500 kc	0	−500 kc

TABLE 3-1 (Cont.)

Radio Receiving Set	*"CHANNEL SELECTOR" Position*	*Frequency Calibration of Screen*		
		Left Side	*Center*	*Right Side*
Receiving Equipment AN/APR-4 includes:				
Tuning Unit TN-16/APR-4	C	−1 mc	0	+1 mc
Tuning Unit TN-17/APR-4	C	−1 mc	0	+1 mc
Tuning Unit TN-18/APR-4	C	+1 mc	0	−1 mc
Tuning Unit TN-19/APR-4	C	+1 mc	0	−1 mc

(3) The radio receiving sets used for panoramic presentation are super-heterodyne circuits and, consequently, produce images of the desired signals as well as the true signals. The peak seen on the screen can be identified as an image or a true signal by following the rules listed below.

Receiver	*Tune in Following Direction*	*Peak Moves Left to Right*	*Peak Moves Right to Left*
Radio Receiving Set AN/ARR-7	Low to high frequency	Image	True
Radio Receiving Set AN/ARR-7	High to low frequency	True	Image
Radio Receiving Set AN/ARR-5 (Low-frequency band)	Low to high frequency	Image	True
Radio Receiving Set AN/ARR-5 (Low-frequency band)	High to low frequency	True	Image
Radio Receiving Set AN/ARR-5 (Two high-frequency bands)	Low to high frequency	True	Image
Radio Receiving Set AN/ARR-5 (Two high-frequency bands)	High to low frequency	Image	True

b. OSCILLOGRAPHIC PRESENTATION. — In oscillographic presentations a picture of the amplitude-modulation envelope of the signal appears on the screen of Indicator ID-60 (XA)/APA-10 (XA-3). (See fig. 3-1.) If the signal is voice-modulated, a pattern of the modulation will appear. If a CW signal is tuned to, the keying pulses will be observed, and the code can be read as well as heard. Radar signals will appear as rapid pulses or "pokes" on the screen. Individual signals can be closely observed and analyzed by using manual scanning of a 2-megacycle frequency strip. By means of this manual scanning any signal within ±1 megacycle of the receiver frequency can be selected and observed.

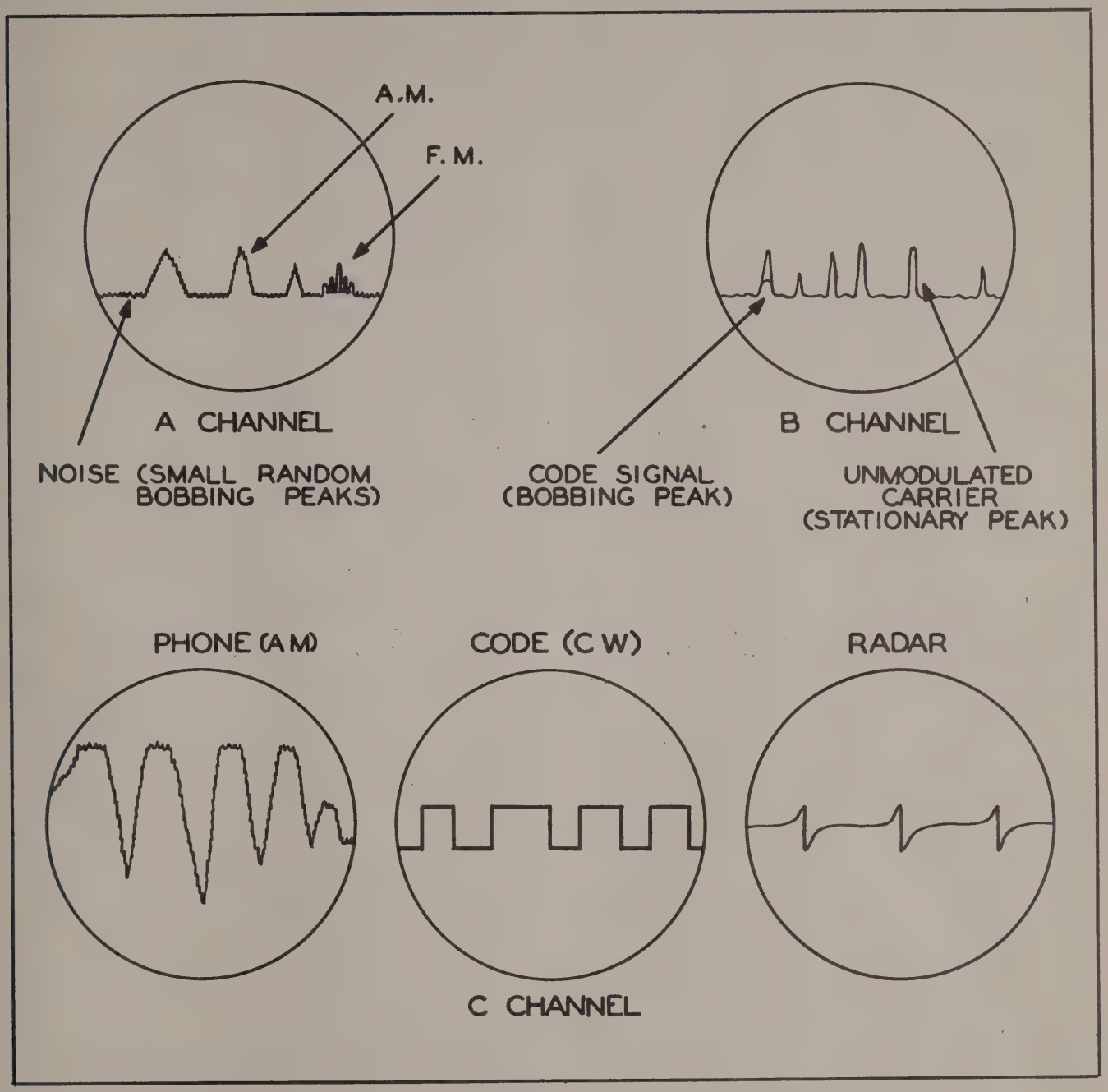


Figure 3-1. Signal Appearance on Screen of Indicator

WARNING

Operation of this equipment involves the use of high voltages which are dangerous to life. Be careful. Observe all safety regulations.

3. STARTING AND STOPPING EQUIPMENT.

a. TO START EQUIPMENT. — Turn all power switches on the associated equipment to "ON". (Refer to the handbooks of maintenance instructions for *Radio Receiving Sets AN/ARR-7, AN/ARR-5,* and for either *Radio Receiving Equipment AN/ARR-1* or *AN/APR-4* or *Radio Set SCR-587-A,* whichever is used.) Turn the "ON-OFF" switch of Indicator ID-60 (XA)/APA-10 (XA-3) to "ON".

b. TO STOP EQUIPMENT. — Turn all power switches on the associated equipment to "OFF". (Refer to the handbooks of maintenance instructions for *Radio Receiving Set AN/ARR-7* or *AN/ARR-5,* or for *Radio Receiving Equipment AN/APR-1* or *AN/APR-4* or *Radio Set SCR-587-A,* whichever is used.) Turn the "ON-OFF" switch of the indicator to "OFF".

4. OPERATION.

(See figure 2-5 for location of all operating controls.)

a. PANORAMIC OPERATION.

Note

Panoramic operation is possible only when the indicator is used with Radio Receiving Set AN/ARR-7 or AN/ARR-5 or equivalent.

(1) Turn "CHANNEL SELECTOR" switch (9) to the "A" or "B" position on Indicator ID-60 (XA)/APA-10 (XA-3). (See fig. 2-5.) A trace line will fall about ¾ inch below the center of the screen. Use the "A" position if it is desired to tune in a signal on Radio Receiving Set AN/ARR-7 and the "B" position if using Radio Receiving Set AN/ARR-5.

(2) Set "VERT. GAIN" control (19) half-way up to obtain a satisfactory signal size.

(3) Set "SWEEP WIDTH" control (18) to maximum.

(4) Tune the radio receiver until a signal is heard in the headset of Indicator ID-60 (XA)/APA-10 (XA-3) and the signal peak is seen on the screen.

(5) Center the peak on the center vertical line by means of "HOR. CENT." control (17). This center peak corresponds to the radio receiving set tuning, and any other peaks appearing on the base line will indicate signals a certain number of kilocycles removed from it. By adding or subtracting the amount observed on the screen and setting the radio receiving set to the new point, the radio receiving set may be tuned to any off-center signal peak seen. When this is done, a new center-frequency peak setting is obtained—that to which the radio receiving set is now tuned. The radio receiving set dial is a working reference point.

(6) To examine a certain peak more closely, operate "SWEEP WIDTH" control (18). As this control is turned toward minimum (counterclockwise) the band of frequencies covered by the sweep is reduced, but the actual sweep width across the screen remains the same. The signal peaks farthest from the center peak frequency are progressively eliminated as the setting is decreased. The sweep width (in kilocycles) at any position can be read directly off the calibrated dial for the "A" channel. For the "B" channel multiply the dial calibrations by 10.

b. OSCILLOGRAPHIC OPERATION ON CHANNEL "C". *(See figure 2-5.)*

(1) Turn "CHANNEL SELECTOR" switch (9) to "C" position on Indicator ID-60 (XA)/APA-10 (XA-3). A trace line will fall along the horizontal center line.

(2) Adjust "VERT. GAIN" control (19) to obtain a satisfactory signal size.

Note

The "SWEEP-WIDTH" control (18) is inoperative.

(3) Set "MAN. SWEEP" control (20) in its center or zero position.

(4) Tune Radio Receiving Equipment AN/APR-1 or AN/APR-4 or Radio Set SCR-587-A (see the handbook of maintenance instructions for the unit used for channel "C") until a signal is heard in the headset. A signal will appear on the screen. Any signal within ±25 kilocycles of this center-peak frequency will be visible on the screen, since the indicator provides a limited bandpass of 50 kilocycles.

(5) Signals within ±1 megacycle can be scanned by manually operating "MAN. SWEEP" control (20). To obtain the location in the radio spectrum of any signal observed on the screen, it is necessary to note the dial reading on the radio receiving set and add or subtract the setting indicated on the "MAN. SWEEP" control.

(6) In oscillographic operation, the following controls may be used.

TABLE 3-2. CONTROLS AND FUNCTIONS

Control	*Function*
"SYNC." (1)	To control synchronization of the sweep
"SWEEP SPEED" "FINE" (2) "COARSE" (3)	To adjust the speed of the sweep
"SYNC. SELECTOR" (7)	Selection of internal or external synchronization ("SERVO" section inoperative)
"HOR. CENT." (17)	To center signal horizontally
"VERT. GAIN" (19)	To adjust vertical amplitude of signals
"MAN. SWEEP" (20)	To adjust the portion of the frequency scanned

c. GENERAL OSCILLOSCOPIC OPERATION.

(See figure 2-5.)

(1) Remove the headset from Indicator ID-60 (XA)/APA-10 (XA-3).

(2) Turn "ON-OFF" switches for Radio Receiving Sets AN/ARR-7, AN/ARR-5, and Radio Receiving Equipment AN/APR-1 or AN/APR-4 or Radio Set SCR-587-A to "OFF". Turn "ON-OFF" switch for Indicator ID-60 (XA)/APA-10 (XA-3) to "ON".

(3) Jacks (10 and 11) are provided for horizontal and vertical inputs. Insert Cord CG-53/AP into the "VERT." jack, and Cord CG-180/AP into the "HOR." jack, depending on the service required. These probes isolate a circuit under test from reaction due to the CRO input impedance and attenuate a signal by ratio of 10:1.

(4) Jack (8) is provided for obtaining external sychronizing voltage. Insert Cord CG-113/AP (low impedance CRO probe) into this jack.

(5) The "SYNC. SELECTOR" switch (7) offers a selection of external or internal synchronization. The

"SERVO" position provides a triggered, non-oscillatory sweep; this position also provides a locking sweep so that a signal with an irregular repetition rate may be held stationary on the oscilloscope screen. The repetition rate is independent of the sweep speed. The speed may be varied from 30 to 20,000 (continuous rate) sweeps per second. In the "SERVO" position an external triggering pulse of sufficient magnitude is necessary to start the oscilloscope sweep. For each pulse there will be one screen sweep; if the pulse has a regular repetition rate, the sweep will operate as in an ordinary oscilloscope. If the pulse rate is irregular, the sweep will not repeat until another pulse is received. In this way the sweep is synchronous with the incoming signal and will always keep in step with the external pulse. The "OSC." section of the "SYNC. SELECTOR" provides an oscillating sweep with either internal or external synchronization. The "SERVO" section provides a non-oscillatory sweep with a choice of internal, external, or power line synchronization.

(6) The "VERT. GAIN" control (19) in the "AMP. OUT" position provides for direct input to one of the vertical oscilloscope plates through a coupling capacitor.

(7) The "SWEEP SPEED COARSE" control in the extreme counterclockwise "HOR. INPUT" position provides an input through a horizontal amplifier. Turning this control to this extreme counterclockwise position permits the feeding of external signals to the horizontal plates through the amplifier. No provision is made for impressing a signal directly on the horizontal plates.

d. CONTROL SETTINGS.—The following table indicates the control used for each setting of "CHANNEL SELECTOR" switch (9). (See fig. 2-5.) The operator should become familiar with the general scheme of active controls for each channel.

TABLE 3-3. CONTROLS FOR USE OF "CHANNEL SELECTOR" SWITCH

Control	*CRO*	*A*	*B*	*C*
"CHANNEL SELECTOR"	CRO	A	B	C
"VERT. GAIN"	Yes	Yes	Yes	Yes
"SWEEP WIDTH"	...	Yes	Yes	...
"MAN. SWEEP"	...	...	...	Yes
"SWEEP SPEED—COARSE"	Yes	...	...	Yes
"SWEEP SPEED—FINE"	Yes	...	...	Yes
"SYNC."	Yes	...	...	Yes
"SYNC. SELECTOR"	Yes	...	...	Yes
"HOR. CENT."	Yes	Yes	Yes	Yes

SECTION IV

EMERGENCY OPERATION AND REPAIR

1. GENERAL.

When Panoramic Adapter AN/APA-10 (XA-3) fails to function, refer to paragraph 2, this section. If the remedies suggested in that paragraph fail to correct the trouble, then refer to paragraph 3, this section.

2. FAILURE SOURCES AND REMEDIES.

The following chart gives possible causes of trouble with the panoramic adapter and their remedies.

Failure	*Probable Source*	*Remedy*
Pilot light out; no beam trace on screen.	Fuse blown.	Replace fuse.
Pilot light on; no trace on screen.	Faulty tubes; defective wiring, line voltage subnormal. "HOR. CENT." control in extreme position.	Replace tubes. See if voltage regulator tubes are glowing.
Pilot light on; trace on screen, but no signals appearing.	Improper receiver, or wrong connections to receiver. "SWEEP WIDTH" may be set at zero.	Check receiver cable connections.
Adapter operating; no signal in phones.	Defective cable connection.	Check receiver phone jack with headset. Check cabling.

3. EMERGENCY OPERATION.

If it is found that panoramic or oscillographic operation is not possible with the "CHANNEL SELECTOR" switch in position "A", "B", or "C", it is still possible to obtain aural presentation by use of the radio receiver without the adapter. This can be done as described below.

a. NO VISUAL PRESENTATION IN "A" POSITION.

(1) Remove the audio cord from the "PHONES" jack and Cord CD-800 from the "PANORAMIC" jack of the radio receiving set.

(2) Remove the headset from Indicator ID-60 (XA)/APA-10 (XA-3) and insert it in the "PHONES" jack of the radio receiving set.

(3) Operate the radio receiving set.

b. NO VISUAL PRESENTATION IN "B" POSITION.

(1) Remove the audio cord from the "PHONES" jack and Cord CD-800 from the "PANORAMIC" jack of the radio receiving set.

(2) Remove the headset from the indicator and insert it in the "PHONES" jack of the radio receiver.

(3) Operate the radio receiving set.

c. NO VISUAL PRESENTATION IN "C" POSITION.

(1) Remove Cord CD-800 from the "PANORAMIC" jack of the radio receiving set.

(2) Remove the headset from the indicator and insert it in the "PHONES" jack of the radio receiving set.

(3) Operate the radio receiving set.

4. FUSE AND PILOT LAMP REPLACEMENT.

a. TO REPLACE A DEFECTIVE FUSE.

(1) Unscrew the small cap marked "FUSE" from the rear left side of the indicator. (See (26), fig. 2-6.)

(2) Slip the defective fuse from its holder in the rear of the cap.

(3) Loosen the locking nuts holding Indicator ID-60 (XA)/APA-10 (XA-3) to Mounting Base MT-171/U.

(4) Remove the indicator from its case.

Note

It may be necessary on some installations to remove the inter-unit cabling to do this.

(5) Locate the spare fuse (usually mounted on the terminal strip on the right side of the main chassis) and remove it from the holding clip.

(6) Replace the indicator in its case.

(7) Relock the indicator securely to the mounting base.

(8) Clip the spare fuse into rear of the cap labeled "FUSE".

(9) Screw the cap back in place.

b. TO REPLACE A DEFECTIVE PILOT LAMP.

(1) Remove the red lamp bezel from the indicator panel by unscrewing it in a counterclockwise direction.

(2) Remove the defective lamp by pushing in slightly on the lamp and turning it 1/8-turn in a counterclockwise direction.

(3) Loosen the locking nuts holding Indicator ID-60 (XA)/APA-10 (XA-3) to Mounting Base MT-171/U.

(4) Remove the indicator from the case.

Note

It may be necessary on some installations to remove the inter-unit cabling to do this.

(5) Locate the spare lamp (usually mounted on the terminal strip on the right side of the main chassis) and remove it from the holding clip.

(6) Replace the indicator in the case.

(7) Relock the indicator securely to the mounting base.

(8) Fit the spare lamp into the socket from which the defective lamp was removed. Then turn the lamp clockwise for 1/8-turn.

(9) Screw the red lamp bezel into place on the panel.

SECTION V
SUPPLEMENTARY DATA

1. CHARACTERISTICS.

The chart below gives physical and electrical characteristics of the panoramic adapter.

Characteristic	*Description*
Overall Dimensions	19 9/16-inch x 10 1/4-inch x 7 5/8-inch
Weight	40 lbs.
Power Requirements	105-125 V.A.C., 400-2600 cycles or 75-85 V.A.C. (by changing transformer tap). Power input approximately 140 watts.
Sensitivity	"A" channel, 400 microvolts or less per 1/4-inch beam deflection. "B" channel, 400 microvolts or less per 1/4-inch beam deflection. "C" channel, 1 volt or less per 1/4-inch beam deflection.
Resolution	12 kc at 3 db down from peak, sweep control at maximum, using CW signal.
Presentation	Panoramic, "A" and "B" channels"; oscillographic, "C" channel.
Sweep Width	Channel A, ±50 kc (100 kc overall). Channel B, ±500 kc (1 mc overall). Channel C, ±1 mc (2 mc overall, manually).
Cathode Ray Sweep	Oscillatory or non-oscillatory "SERVO". Variable sawtooth generator, 35 to 40,000 cps.
Audio Output	50 milliwatts into 600 or 8000 ohm load.
Vertical Amplifier	Single stage, ±1 db from 30 cycles to 60 kc or higher. "AMP. OUT" position permits direct connection to one vertical plate through coupling capacitor.
Horizontal Amplifier	Single stage, ±1 db from 30 cycles to 60 kc. No provision for direct connection to deflection plates.

Characteristic	*Description*	
Cathode Ray Tube	Cathode to accelerating anode.	
Voltage	1200 volts.	
Cathode Ray Input	Shunt	Shunt
	Resistance:	*Capacitance:*
Impedance		
At jack	800,000 ohms	125 mmfd.
Using high impedance probe	8 megohms	12.5 mmfd.
Using low impedance probe	800,000 ohms	200 mmfd.
	Horizontal:	*Vertical:*
Sensitivity of cathode ray oscilloscope		
Maximum through amplifier	30 volts peak-to-peak per inch	1.5 volts peak-to-peak
Amplifier		150 volts peak-to-peak per inch
Noise	No disturbance in excess of 25,000 microvolts between 200 kc and 200 mc generated by equipment.	

2. INDICATOR CONTROLS.

a. PANEL CONTROLS. — *(See figure 2-5.)* — The functions of the controls appearing on the panel of the panoramic adapter are listed in the following table.

Control	*Use*
"SYNC." (1)	Control of synchronizing voltage and polarity (1).
"SWEEP SPEED—FINE" (2)	Sweep adjustment in CRO and C channels (2).
"SWEEP SPEED—COARSE" (3)	Sweep adjustment in CRO and C channels (3).
"ON-OFF"	Power Switch (5).
"SYNC. SELECTOR" (7)	Oscilloscope synchronizing in CRO channel (7).
"CHANNEL SELECTOR" (9)	Selecting channel of operation (8).
"HOR. CENT." (17)	Centering signal horizontally (17).
"SWEEP WIDTH" (18)	Controlling channel width in "A" and "B" channels (18).
"VERT. GAIN" (19)	Controlling vertical amplitude of signals on cathode ray screen (19).
"MAN. SWEEP" (20)	Controlling manual signal scanning on C channel (20).

b. FIXED CONTROLS. — Screwdriver adjustments indicated in figures 2-6 and 2-7 provide for permanent adjustments of the unit. Once set, these controls need little or no readjustment.

Control Number and Identification	*Function*
"BLANKING" (21)	Eliminates return traces of cathode beam.
"HORIZ." GAIN (22)	Controls length of beam base line.
"AUX." FOCUS (23)	Beam focus; eliminates "fuzziness" of image.
"INTENSITY" (24)	Beam intensity control, as for a cathode ray oscilloscope.
"FOCUS" (25)	Beam focus control, as for a cathode ray oscilloscope.
"SENSITIVITY, C CHANNEL" (27)	
"SENSITIVITY, A CHANNEL" (28)	
"DEVIATION LIMIT, A CHANNEL" (29)	Adjusts band width of "A" channel.
"DEVIATION LIMIT, B CHANNEL" (30)	Adjusts band width of "B" channel.
"VERTICAL CENTERING" (31)	Sets base line of cathode sweep.
"MAN. SWEEP TRIMMER" (32)	Adjusts calibration of "C" channel.

(NOTE: In addition, 19 trimmer adjustments on coil cans are provided. These are for maintenance use only and should not be adjusted in normal operation.)

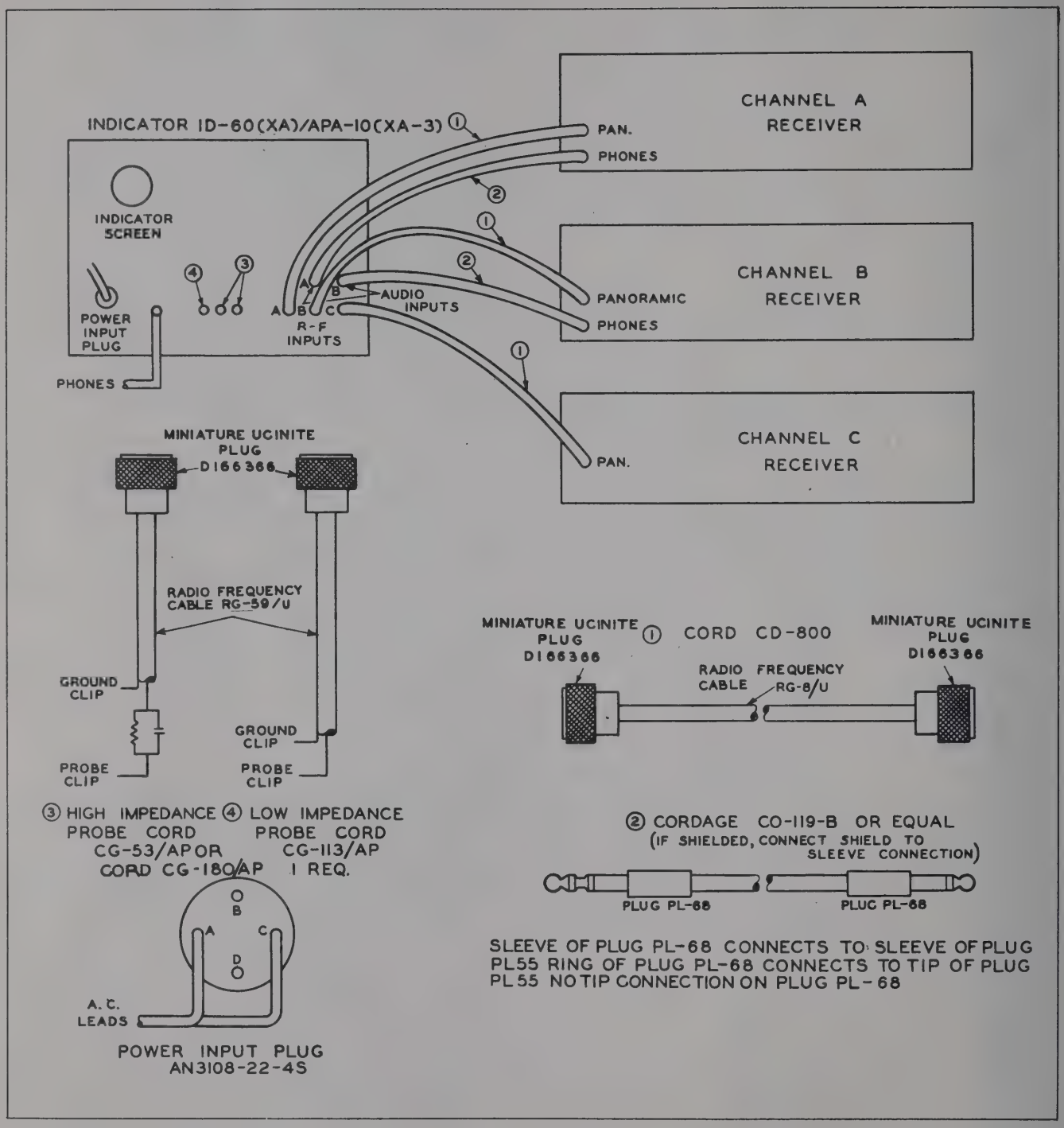
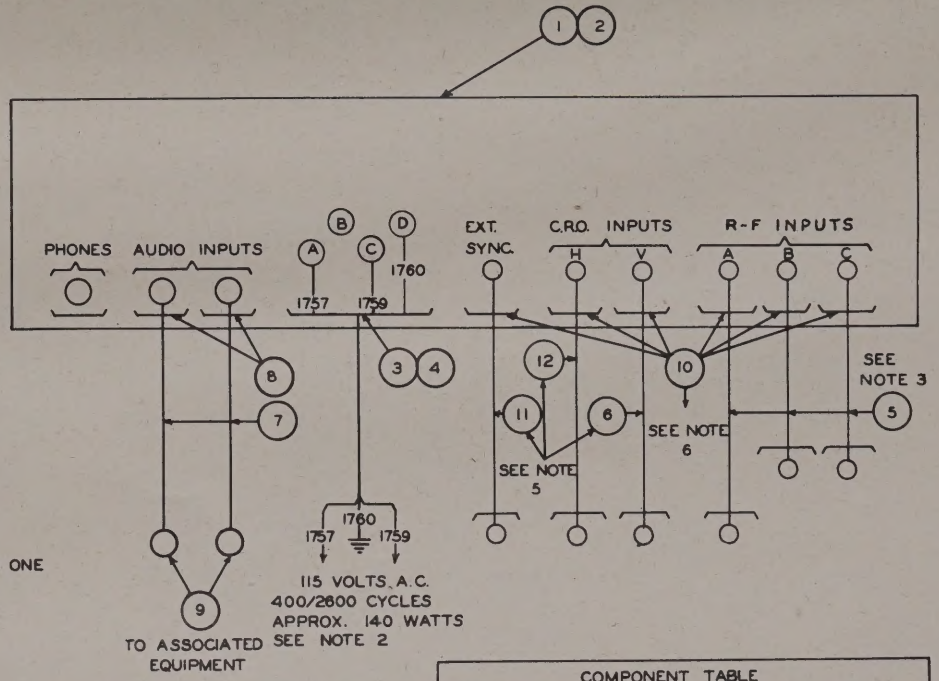


Figure 5-1. Cording Connections to Panoramic Adapter AN/APA-10 (XA-3)

WIRE TABLE				
ALL WIRES TO BE AIRCRAFT CABLE PER SPEC. AN-J-C-48 UNLESS OTHERWISE SPECIFIED. +INDICATES WIRES TO BE INDIVIDUALLY SHIELDED PER SPEC. 95-27273. ⊗ INDICATES WIRES WHOSE VOLTAGE DROP MUST NOT EXCEED LIMITS OF SPEC. 95-32310				
REF NOTE	WIRE NO.	MAXIMUM OPERATING VOLTAGE	MAX. ALLOWABLE RESISTANCE IN OHMS (71°C.)	MINIMUM CABLE SIZE PERMITTED
4	1757	115 A.C.	0.400	AN 20+⊗
4	1759	115 A.C.	0.400	AN +⊗
	1760	0	0.002	AN 20



6 THESE ADAPTERS M-359 WILL BE USED AS INSTALLATION DEMANDS REQUIRE.

5 THESE TEST CORDS HAVE UCINITE PLUGS D166366 ON ONE END OF RADIO FREQUENCY CABLE RG-59/U AND THE OTHER END TERMINATES IN ALLIGATOR CLIPS.

4 WIRES 1757 & 1759 SHALL BE SHIELDED WHEN ROUTED CLOSE TO AND PARALLEL TO SKIN OF AIRPLANE FOR ANY LENGTH GREATER THAN THREE FEET. THESE WIRES MAY BE ALREADY INSTALLED ON RAVEN EQUIP. RACK AND CONNECTED TO TERMINAL STRIP IN TERMINAL BOX J-49/A.

3 CORD CD-800 IS PROCURED IN TWO (2) LENGTHS, 20 AND 30 INCHES. THE LATTER IS TO BE CONNECTED TO SOCKET A. THE CORD CONSISTS OF RADIO FREQUENCY CABLE RG-8/U WITH UCINITE PLUGS D166366 ON EACH END. RIGHT ANGLE ADAPTERS M-359 MAY BE USED ON THESE CORDS WHERE NECESSARY.

2 POWER PLUG AN 3108-22-4S MAY BE ALREADY INSTALLED ON RAVEN RACK AND WIRE 1759 (ONE SIDE OF A.C.) MAY BE GROUNDED IN WHICH CASE A JUMPER BETWEEN PIN C AND D MAY BE INSTALLED IN PLACE OF WIRE 1760.

1 ALL TERMINAL STRIPS REQUIRED IN THE INSTALLATION OF THE WIRING SHALL BE MADE OF SUITABLE INSULATING MATERIAL AND WITH TERMINAL SPACING TO PROVIDE AGAINST VOLTAGE BREAKDOWN.

COMPONENT TABLE				
ITEM	QUAN. REQD.	EQUIPMENT NOMENCLATURE: DESCRIPTION	EQUIPMENT NOMENCLATURE: TYPE NO.	SPEC. OR INSTALLATION DRAWING
* 1	1	INDICATOR	ID-40(XA)/APA-10(XA-3)	H44G3448
* 2	1	MOUNTING	MT-171/U	H44G3448
* 3	1	PLUG	AN 3108-22-4S	AN9534
* 4	1	ADAPTER	AN 3057-12	AN3057
* 5	3	CORD (SEE NOTE 3)	CD-800	
* 6	2	CORD (SEE NOTE 5)	CG-53/AP	
* 7	AS REQD	CORDAGE	CO-119B	
* 8	2	PLUG	PL-68	
* 9	2	PLUG	PL-55	
* 10	6	ADAPTER (RT. ANGLE) SEE NOTE 6	M-359	H43G11747
* 11	1	CORD (SEE NOTE 5)	CG-113/AP	
* 12	1	CORD (SEE NOTE 5)	CG-180/AP	

* INDICATES GOVERNMENT FURNISHED EQUIPMENT

Figure 5-2. Installation Specification Data